

**What is claimed is:**

1. (Currently Amended) An apparatus with a heat source comprising at least one electric or electronic component, with a heat sink and with an intermediate layer made of a thermally conductive material provided between the heat source and the heat sink, wherein the intermediate layer consists of an organic matrix with embedded nanofibers, the length of at least a majority of the nanofibers embedded in the organic matrix is between 1-100 $\mu$ m and wherein the heat source and the heat sink bear with thermally conductive surfaces against the intermediate layer with a surface pressure between approximately 0.1 and 100 bar, wherein the organic matrix is already in the viscous or liquid state at a temperature between 10 and 30°C and is in the viscous state or the liquid state at an operating temperature of the apparatus higher than 30°C or at a temperature between 40°C and 80°C; and wherein the percentage of nanofibers in the matrix is between 5 and 20 percent by weight in relation to the total mass of the intermediate layer, and wherein a length/thickness ratio of a majority of the nanofibers embedded in the organic matrix is greater than 10, and wherein the thickness of the intermediate layer is between 0.01mm and 0.5mm.
2. (Cancelled)
3. (Cancelled)
4. (Cancelled)
5. (Previously Presented) The apparatus according to claim 1, wherein the organic matrix contains at least one oil, such as a synthetic oil, or a silicone oil.
6. (Previously Presented) The apparatus according to claim 1, wherein the organic matrix contains at least partially an elastomer, such as a completely or only partially cross-linked elastomer, or a synthetic elastomer, or silicone rubber.

7. (Previously Presented) The apparatus according to claim 1, wherein the organic matrix is at least partially a polymer, a polycarbonate, a polypropylene or a polyethylene.
8. (Cancelled)
9. (Cancelled)
10. (Cancelled)
11. (Cancelled)
12. (Previously Presented) The apparatus according to claim 1, wherein at least part of the nanofibers are made of carbon, boron nitride, or tungsten carbide.
13. (Cancelled)
14. (Previously Presented) The apparatus according to claim 1, wherein the nanofibers in the organic matrix are oriented in a random and/or tangled configuration.
15. (Previously Presented) The apparatus according to claim 1, wherein the nanofibers in the organic matrix at least for the most part are oriented in the same direction longitudinally, perpendicular or crosswise to the adjacent heat transfer surfaces or parallel or approximately parallel to the heat transfer surfaces.
16. (Previously Presented) The apparatus according to claim 15, further comprising means for orienting and/or maintaining the orientation of the nanofibers in the organic matrix, by means for creating an electric field intensity in the organic matrix.
17. (Previously Presented) The apparatus according to claim 1, wherein at least part of the nanofibers embedded in the organic matrix form a two-dimensional or three-dimensional

structure, in which the nanofibers are linked with each other, in the form of a web or web-like structure, a non-woven material structure and/or a network or screen-like structure.

18. (Previously Presented) The apparatus according to claim 1, wherein the organic matrix contains further components or additives in a percentage that is lower than the percentage of nanofibers.
19. (Previously Presented) The apparatus according to claim 18, wherein the organic matrix contains at least one thermally conductive ceramic in the form of fine particles or powder as an additive, selected from Al<sub>2</sub>O<sub>3</sub>, AlN, BN, Si<sub>3</sub>N<sub>4</sub>, SiC, BeO, ZrO.
20. (Previously Presented) The apparatus according to claim 18, wherein the organic matrix contains as an additive at least one metal and/or metal compound and/or metal alloy in the form of fine particles or powder, selected from silver, copper or gold.
21. (Previously Presented) The apparatus according to claim 18, wherein the matrix contains as an additive, in the form of fine particles or powder, at least one material and/or material compound and/or alloy that is heat-conductive and changes to molten state at temperatures above 50°C.
22. (Previously Presented) The apparatus according to claim 1, wherein at least part of the nanofibers are nanotubes, for example single-walled and/or double-walled nanotubes.
23. (Previously Presented) The apparatus according to claim 1, wherein at least part of the nanofibers are coated with at least one metal.
24. (Previously Presented) The apparatus according to claim 1, wherein the nanofibers made of carbon are such nanofibers that were subjected to a heat treatment or graphitization step at a temperature between 2700 – 3100°C before being embedded in the organic matrix.

25. (Previously Presented) The apparatus according to claim 1, wherein the heat source is formed by at least one electronic component, such as diode, semiconductor switch or control element, a transistor, a mosfet or by an integrated component.
26. (Previously Presented) The apparatus according to claim 1, wherein the heat source is formed by at least one circuit or module with at least one electric or electronic component, which is located on a metal-ceramic substrate manufactured using the DCB process or active soldering process, wherein the intermediate layer is located between one metallization of the substrate and one heat transfer surface adjacent to said metallization.
27. (Previously Presented) The apparatus according to claim 1, wherein the heat source is formed by a microprocessor, at least one laser diode or one laser diode bar.
28. (Cancelled)
29. (Previously Presented) The apparatus according to claim 1, wherein the heat sink is formed by a passive cooler with cooling fins, cooling pins or similar structures.
30. (Previously Presented) The apparatus according to claim 1, wherein the heat sink comprises at least one active cooler through which a coolant circulates.
31. (Previously Presented) The apparatus according to claim 30, the at least one cooler is part of a coolant circulation system.
32. (Previously Presented) The apparatus according to claim 1, wherein the heat sink comprises at least one heat pipe and that the intermediate layer is provided at least between the heat source and one cooling surface formed by the heat pipe.
33. (Previously Presented) The apparatus according to claim 32, wherein one cooler or heat exchanger is provided on the heat pipe, wherein at least one intermediate layer is provided between the heat pipe and this heat exchanger or cooler.

34. (Previously Presented) The apparatus according to claim 32, wherein the heat pipe functions as a heat pump or heat spreader.

35. (Cancelled)

36. (Currently Amended) A thermally conductive mass, for forming an intermediate layer between a heat source and a heat sink, wherein the mass consists of an organic matrix with embedded nanofibers and the length of at least for a majority of the nanofibers embedded in the organic matrix is between 1-100  $\mu\text{m}$ , wherein the organic matrix is already in the viscous or liquid state at a temperature between 10 and 30°C and is also in the viscous state or in a liquid state at a temperature higher than 30°C or at a temperature between 40 and 80°C, and wherein the percentage of nanofibers in the matrix is between 5 and 20 percent by weight in relation to the total mass of the intermediate layer and wherein the nanofibers have a thickness between approximately 1.3 nm and 300 nm, wherein the length/thickness ratio of a majority of the nanofibers embedded in the organic matrix is greater than 10, and wherein the thickness of the intermediate layer is between 0.01 mm and 0.5 mm.

37. (Previously Presented) The thermally conductive mass according to claim 36, wherein the organic matrix, at least at the operating temperature of the apparatus or of the heat source, is in a viscous or liquid state, or a semi-liquid state.

38. (Cancelled)

39. (Cancelled)

40. (Previously Presented) The thermally conductive mass according to claim 36, wherein the organic matrix contains at least one oil, a synthetic oil, or a silicone oil.

41. (Previously Presented) The thermally conductive mass according to claim 36, wherein the organic matrix contains at least partially an elastomer, a completely or only partially cross-linked elastomer, a synthetic elastomer or a silicone rubber.
42. (Previously Presented) The thermally conductive mass according to claim 36, wherein the organic matrix is at least partially a polymer, selected from polycarbonate, polypropylene or polyethylene.
43. (Cancelled)
44. (Cancelled)
45. (Cancelled)
46. (Cancelled)
47. (Previously Presented) The thermally conductive mass according to claim 36, wherein at least part of the nanofibers are made of carbon, boron nitride and/or tungsten carbide.
48. (Cancelled)
49. (Previously Presented) The thermally conductive mass according to claim 36, wherein the nanofibers in the organic matrix are oriented in a random and/or tangled configuration.
50. (Previously Presented) The thermally conductive mass according to claim 36, wherein the nanofibers in the organic matrix at least for the most part are oriented in the same direction longitudinally perpendicular or crosswise to the adjacent heat transfer or parallel or approximately parallel to the heat transfer surfaces.
51. (Previously Presented) The thermally conductive mass according to claim 36, wherein at least part of the nanofibers embedded in the organic matrix form a two-dimensional or three-dimensional structure, in which the nanofibers are linked with each other, in the form of a web

or web-like structure, a non-woven material structure and/or a network or screen-like structure.

52. (Previously Presented) The thermally conductive mass according to claim 36, wherein the organic matrix contains further components or additives, in a percentage that is lower than the percentage of nanofibers.

53. (Previously Presented) The thermally conductive mass according to claim 52, wherein the organic matrix contains as an additive at least one thermally conductive ceramic in the form of fine particles or powder, selected from Al<sub>2</sub>O<sub>3</sub>, AlN, BN, Si<sub>3</sub>N<sub>4</sub>, SiC, BeO, ZrO.

54. (Previously Presented) The thermally conductive mass according to claim 52, wherein the organic matrix contains as an additive at least one metal and/or metal compound and/or metal alloy in the form of fine particles or powder, such as silver, copper or gold.

55. (Previously Presented) The thermally conductive mass according to claim 52, wherein the matrix contains as an additive, in the form of fine particles or powder, at least one material and/or material compound and/or alloy that is heat-conductive and changes to molten state at temperatures above 50°C.

56. (Previously Presented) The thermally conductive mass according to claim 36, wherein at least part of the nanofibers are nanotubes, single-walled and/or double-walled nanotubes.

57. (Previously Presented) The thermally conductive mass according to claim 36, wherein at least part of the nanofibers are coated with at least one metal.

58. (Previously Presented) The thermally conductive mass according to claim 36, wherein the nanofibers made of carbon are such nanofibers that were subjected to a heat treatment or graphitization step at a temperature between 2700 – 3100°C before being embedded in the organic matrix.